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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,083	05/31/2006	Tomoichiro Tamura	060398	2052

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KRATZ, QUINTOS & HANSON, LLP
1420 K Street, N.W.
Suite 400
WASHINGTON, DC 20005

EXAMINER	
COX, ALEXIS K	

ART UNIT	PAPER NUMBER
3744	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/581,083	TAMURA ET AL.	
	Examiner	Art Unit	
	ALEXIS K. COX	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3-8, 11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alsenz (US Patent No. 5,035,119), Fu et al (US Patent No. 5,433,019), and Dias (US Patent No. 6,123,146).

Regarding claims 1, 3-5, and 7-8, figure 1 of Alsenz discloses a heat pump apparatus composed by sequentially connecting in series a compressor (30, see column 4 line 59) that compresses a refrigerant, a radiator (34, see column 4 line 59) that radiates the refrigerant discharged from the compressor, an expansion valve (38, see column 4 line 60) that expands the refrigerant radiated in the radiator, and an evaporator (44, see column 4 line 60) that evaporates the refrigerant expanded by the expansion valve. Alsenz further discloses a first temperature sensor (54, see column 5 line 68) for detecting the temperature of the refrigerant between the outlet of the evaporator and the inlet of the compressor and control means (10, 200, see column 4 line 55 and column 8 line 29; see also figures 9 and 10) for controlling a superheat value by changing flow resistance of the expansion valve (see column 4 lines 54-55 and column 5 lines 41-44) based on a detected value of the first temperature sensor. Additionally, Alsenz discloses storage means (200, see column 8 line 29) capable of storing correlation data between time elapsing from start of operation of the heat pump apparatus and evaporation temperature of the refrigerant in the evaporator, and a target superheat value in advance; a timer (170, see column 13 lines 26-33) capable of detecting operation time of the heat pump apparatus; and processing means (200, see column 13 lines 45-49) capable of estimating evaporation temperature of the refrigerant based on the operation time detected by the timer and the correlation data stored in the

storage means, and then estimating a superheat value based on the estimated evaporation temperature and the detected value detected by the first temperature sensor, wherein the control means is capable of controlling the flow resistance of the expansion valve so that the superheat value estimated by the processing means becomes the target superheat value stored in the storage means. Alsenz further discloses a second temperature sensor (52, see column 8 lines 12-13) for detecting the temperature of the refrigerant between the outlet of the expansion valve and the inlet of the evaporator, and a third temperature sensor (70, see column 12 line 22) for detecting the temperature of the refrigerant between the outlet of the compressor and the inlet of the expansion valve. It is noted that Alsenz does not explicitly disclose its utilization in a drying apparatus, an air channel in which drying air heated in the radiator is introduced to a subject to be dried, the drying air that absorbs moisture from the subject to be dried being dehumidified in the evaporator, and the dehumidified air being then heated in the radiator again to reuse the dehumidified air as the drying air. However, Fu et al explicitly discloses a drying apparatus with an air channel (34, see column 4 lines 3-4) in which drying air which has been heated is introduced to a subject to be dried, the drying air that absorbs moisture from the subject to be dried is dehumidified (44, 33, 30, 10, see column 3 lines 60-62 and 53-56), and the dehumidified air is then heated again to reuse the dehumidified air as the drying air (see column 4 lines 12-14). Fu et al further discloses that all basic elements of the system are commercially available and there may be equivalent devices different from the ones described (see column 4 lines 23-28). As the heat pump of Alsenz would fulfill the purpose of the radiator and

dehumidifier of Fu et al, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Alsenz and Fu et al to form a tea preparation device of greater efficiency than that of Fu et al alone. It is further noted that Alsenz does not explicitly disclose the storage means to actually store correlation data between time elapsing from the start of operation of the heat pump apparatus and evaporation temperature of the refrigerant in the evaporator, and a target superheat value in advance; the timer to detect operation of the entire heat pump apparatus, or the processor to estimate the evaporation temperature of the refrigerant based on the operation time and the correlation data, and use that estimated evaporation temperature and the detected value by the first temperature sensor to estimate a superheat value. Dias explicitly discloses the estimation of an actual superheat value of an evaporator based on correlation data (second mathematical relationship, see column 3 lines 53-55), an estimated temperature based on the correlation data and operating time of the entire heat pump system, and a measured value of temperature (see column 3 lines 53-62). As the systems of Dias, Fu, and Alsenz are all heat pumps, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the algorithm of Dias in the system of Fu and Alsenz in order to avoid the expensive use of additional temperature sensors.

Regarding claims 6 and 11, Alsenz further discloses selection means (200, see column 8 line 29) capable of selecting whether to apply the superheat value larger than that before the predetermined time elapses to that after the predetermined time elapses or not. Further, this selection means is an obvious part of the control of superheat to a

target superheat value, as without adjustment of the target superheat value according to the current needs of the system, the operation of the system will be less efficient.

Further regarding claims 1, 3-6, 8, and 11, the applicant is reminded that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims.

Regarding claim 15, it is noted that Alsenz and Fu et al only discloses a system capable of performing the method described in this apparatus claim, and does not explicitly disclose the method claimed. Dias explicitly discloses estimating evaporation temperature of refrigerant based on operation time and correlation data (see column 3 lines 46-59). As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to estimate the evaporation temperature using the method claimed in order to minimize the number of sensors required.

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alsenz (US Patent No. 5,035,119), Fu et al (US Patent No. 5,433,019), and Dias (US Patent No. 6,123,146), in view of Tanaka et al.

Regarding claims 9 and 10, it is noted that Alsenz, Dias, and Fu et al do not disclose pressure detecting means for detecting discharge pressure of the compressor. However, Tanaka et al explicitly discloses pressure detecting means (102, see column 5 lines 29-31 and figure 1) for detecting discharge pressure of the compressor. Further, as the systems of Alsenz and Tanaka are of similar structure and function, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement

the pressure sensor of Tanaka et al in the system of Alsenz, Fu et al, and Dias in order to provide more information for more accurate and efficient control of the system.

Further regarding claim 10, the applicant is reminded that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims.

6. Claims 1, 3-8, 11-12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alsenz (US Patent No. 5,035,119), Smith (US Patent No. 2,418,239), and Dias (US Patent No. 6,123,146).

Regarding claims 1, 3-5, 7, 8, 12, and 15, figure 1 of Alsenz discloses a heat pump apparatus composed by sequentially connecting in series a compressor (30, see column 4 line 59) that compresses a refrigerant, a radiator (34, see column 4 line 59) that radiates the refrigerant discharged from the compressor, an expansion valve (38, see column 4 line 60) that expands the refrigerant radiated in the radiator, and an evaporator (44, see column 4 line 60) that evaporates the refrigerant expanded by the expansion valve. Alsenz further discloses a first temperature sensor (54, see column 5 line 68) for detecting the temperature of the refrigerant between the outlet of the evaporator and the inlet of the compressor and control means (10, 200, see column 4 line 55 and column 8 line 29; see also figures 9 and 10) for controlling a superheat value by changing flow resistance of the expansion valve (see column 4 lines 54-55 and column 5 lines 41-44) based on a detected value of the first temperature sensor. Additionally, Alsenz discloses storage means (200, see column 8 line 29) capable of

storing correlation data between time elapsing from start of operation of the heat pump apparatus and evaporation temperature of the refrigerant in the evaporator, and a target superheat value in advance; a timer (170, see column 13 lines 26-33) capable of detecting operation time of the heat pump apparatus; and processing means (200, see column 13 lines 45-49) capable of estimating evaporation temperature of the refrigerant based on the operation time detected by the timer and the correlation data stored in the storage means, and then estimating a superheat value based on the estimated evaporation temperature and the detected value detected by the first temperature sensor, wherein the control means is capable of controlling the flow resistance of the expansion valve so that the superheat value estimated by the processing means becomes the target superheat value stored in the storage means. Alsenz further discloses a second temperature sensor (52, see column 8 lines 12-13) for detecting the temperature of the refrigerant between the outlet of the expansion valve and the inlet of the evaporator, and a third temperature sensor (70, see column 12 line 22) for detecting the temperature of the refrigerant between the outlet of the compressor and the inlet of the expansion valve. It is noted that Alsenz does not explicitly disclose its utilization in a drying apparatus, an air channel in which drying air heated in the radiator is introduced to a subject to be dried, the drying air that absorbs moisture from the subject to be dried being dehumidified in the evaporator, and the dehumidified air being then heated in the radiator again to reuse the dehumidified air as the drying air. Smith explicitly discloses the use of a refrigeration system in a clothes dryer, with an air channel in which drying air heated in the radiator (13, see column 3 lines 8-11) and introduced to a subject to be

dried (see column 3 lines 13-16), the drying air that absorbs moisture from the subject to be dried is dehumidified in the evaporator (15, see column 3 lines 16-20), and the dehumidified air is then heated in the radiator again to reuse the dehumidified air as the drying air (see column 3 lines 20-23). It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use the system of Alsenz in the dryer of Smith in order to permit better control of the drying process in the clothes dryer of Smith. It is noted that Alsenz and Smith only discloses a system capable of performing the method described in this apparatus claim, and does not explicitly disclose the method claimed. Dias explicitly discloses estimating evaporation temperature of refrigerant based on operation time and correlation data (see column 3 lines 46-59) combined with one measured temperature. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to estimate the evaporation temperature using the method claimed in order to minimize the number of sensors required.

Regarding claims 6 and 11, Alsenz further discloses selection means (200, see column 8 line 29) capable of selecting whether to apply the superheat value larger than that before the predetermined time elapses to that after the predetermined time elapses or not.

7. Claims 13-14 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Alsenz (US Patent No. 5,035,119), Smith (US Patent No. 2,418,239), and Dias (US Patent No. 6,123,146), in view of Hashimoto et al (US Patent No. 5,752,323).

Regarding claims 13 and 14, it is noted that Alsenz, Smith, and Dias are not disclosed to be operating on a room dehumidifier or bathroom dryer. Hashimoto et al is explicitly disclosed to be operable as a room dehumidifier or bathroom dryer (see column 1 lines 7-10), which may be used as an alternative to or is considered by the inventor to be similar to a clothes dryer (see column 1 lines 21-23). As these things are considered equivalent in prior art, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the system of Alsenz and Smith to a room dehumidifier or bathroom dryer.

Response to Arguments

8. Applicant's arguments with respect to claims 1 and 3-15 have been considered but are moot in view of the new ground(s) of rejection.

Regarding claim 1, the applicant asserts that the correlation feature itself is not disclosed in Alsenz. However, as the algorithm disclosed by Dias required the presence of the correlation feature itself, this is unpersuasive.

Regarding claim 1, the applicant further argues that the timer of Alsenz is only for flushing oil from the evaporator coils. It is true that the timer of Alsenz determines the interval of operation of a subcomponent of the heat pump system, rather than the entire system. However, again, Dias discloses a timer which exactly performs the required function.

In general, the applicant further asserts that there are no citations for most other features disclosed by Alsenz. Specifically, "operation time" and "estimating are asserted

to be absent. As both of these are explicitly present in Dias, this is considered unpersuasive.

Regarding the assertion that humidity is not a concern for refrigeration, the examiner respectfully suggests that this is both incorrect and irrelevant. Although the word "humidity" may not be present in the patent of Alsenz, it is also not present in the claims. As this feature is not claimed, its presence or absence is irrelevant. Additionally, in any environment being cooled, humidity is inherently a concern, as to reduce temperature without reducing humidity will result in an increase in relative humidity, which can cause discomfort and or mold or fungus.

Regarding the assertion that preserving flavor is unrelated to refrigeration or drying, the applicant is respectfully reminded that the purpose of the patent of Fu is to preserve flavor *by controlling the humidity and temperature of the drying process*. (See column 1 lines 10-12) Further, this argument is moot, as all claims rejected under Fu have also been rejected with other art.

Regarding the argument of disparate fields, the examiner respectfully submits that if the applicant does not wish the patent to be applicable to such disparate fields, a narrower claiming of the invention is required.

Regarding claims 14-17, the argument is moot in view of the rejection above. Further regarding claims 16 and 17, it is suggested that if the applicant wishes consideration of these claims, they must be submitted to the office.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

This final rejections replaces the previously sent final rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 8:00a.m. to 5:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AKC/
/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744